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Principal: Mrs C Stanyer

Subject: BIOLOGY (TRIPLE) Year 10 Curriculum Map 2020 – 2021

Resources:

Week Commencing	Topic (including links to additional resources)	Assessment Window
1 st September	Bridging work	
7 th September	Bridging work	
14 th September	Bridging work	
21 st September	Bridging work (TOTAL OF 6 lessons of bridging work)	
28 th September	<p><u>TOPIC Homeostasis and response</u> <u>Lesson 1 Introduction to homeostasis</u> Explain what homeostasis is and why it is important. Describe examples of conditions that need to be controlled. Describe the roles of the nervous system and the endocrine system in homeostasis. Describe the main components of a control system and their functions.</p> <p><u>Lesson 2 – Structure and function of the nervous system</u> Explain the importance of being able to respond to environmental changes and coordinate behaviour. Explain how the nervous system is adapted for its functions. Describe the functions of the main structures in the nervous system. Explain the role of chemicals at synapses. Describe and use different methods to measure reaction time.</p>	
5 th October	<p><u>Lesson 3 – Required practical – reaction time</u> Make a plan to investigate a factor on human reaction time. Carry out a controlled investigation, present and analyse the results.</p>	
12 th October	<p><u>Lesson 4 – Reflex actions the brain</u> Explain the importance of reflex actions and give examples. Describe the differences between voluntary and reflex actions. Describe the stages of a reflex action.</p> <p><u>Lesson 5 – The brain</u> Identify the cerebral cortex, cerebellum and medulla on a diagram and describe the function of each. HT: Describe the techniques used to map areas of the brain to their functions. Evaluate the benefits and risks of procedures carried out on the brain and nervous system.</p>	

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19 th October (inset Friday 22 nd)	<p><u>Lesson 6 – The eye</u></p> <p>Label a diagram of the eye and describe the function of each structure. Define the term 'accommodation'. Describe how the eye changes to focus on near and distant objects. Complete simple ray diagrams to show normal vision, long-sightedness and short-sightedness.</p>	
Half Term		
2 nd November	<p><u>Lesson 7 and 8 – Control of body temperature</u></p> <p>Describe different methods to measure body temperature. Explain how body temperature is monitored and controlled. Describe and explain the changes that happen when body temperature is too high or too low. Explain why we drink more fluid during hot weather. Plot cooling curves.</p>	
9 th November	<p><u>Lesson 9 – Human endocrine system</u></p> <p>Describe the endocrine system and define the term hormone. Relate hormone release and hormone action to the control system model. Label a diagram of the organs in the endocrine system. Explain why the pituitary gland is often called the master gland. Compare the actions of the nervous and endocrine systems.</p>	
16 th November	<p><u>Lesson 10 – Control of blood glucose concentration</u></p> <p>Describe how blood glucose concentration is monitored and controlled. Explain when insulin is produced and how it helps to control blood glucose levels. Describe glycogen as a stored carbohydrate. HT: Explain when glucagon is produced by the pancreas and its effect on blood glucose levels. Explain how insulin and glucagon work together to control blood glucose levels. Explain the cause, effects, treatment and problems associated with Type 1 diabetes. Interpret glucose tolerance test results. Evaluate modern methods of treating diabetes. Explain the cause, treatment and problems associated with Type 2 diabetes. Compare the causes, and treatments of Type 1 and Type 2 diabetes.</p> <p><u>Lesson 11 – Water and nitrogen balance</u></p> <p>Describe where water, ions and urea are lost from the body. Explain why there is no control over water, ion and urea loss by the lungs and skin. Explain when cells might gain or lose too much water, in terms of osmosis. Describe the effect of too much or too little water on cells. Explain how the body responds to different temperature and osmotic challenges in terms of sweat and urine release. HT: Describe how amino acids are deaminated in the liver to form ammonia, which is converted to urea for excretion.</p>	
23 rd November	Prep for AR2	
30 th November	AR1 assessment DDI wave 1	AR 1 ASSESSMENTS
7 th December	DDI Wave 2	AR 1 ASSESSMENTS
14 th December	Reassessment and review	

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Christmas Holiday		
4 th January	<p><u>Lesson 12 – Kidney function</u> Label a diagram of the excretory system. Describe how urine is produced. Describe the absorption of glucose and ions by diffusion and active transport.</p> <p><u>Lesson 13 – ADH</u> HT: Identify the site of production and target organs for ADH. Describe the effects of ADH on kidney tubules. Explain, with the aid of a diagram, how ADH controls the concentration of the blood using a negative feedback mechanism</p>	
11 th January	<p><u>Lesson 14 – Kidney failure</u> Describe the advantages and disadvantages of a kidney transplant. Explain how a kidney machine works. Explain why dialysis fluid contains sugar and ions at the same concentration as normal blood, but no urea. Evaluate the use of kidney transplants and dialysis to treat kidney failure.</p>	
18 th January	<p><u>Lesson 15 – Hormones in reproduction</u> Describe secondary sexual characteristics of boys and girls. Explain the cause of these changes in boys and girls and their relevance in reproduction. Describe the menstrual cycle and fertility including the role of hormones Oestrogen is secreted by the ovaries. It inhibits production of FSH and stimulates release of LH. It makes the uterus lining grow again after menstruation. Progesterone is secreted by the empty follicle in the ovary after ovulation. It inhibits FSH and LH production and maintains the lining of the uterus during the second half of the cycle. HT: explain the interaction between these hormones in the control of the menstrual cycle.</p> <p><u>Lesson 16 – Contraception</u> Describe hormonal and non-hormonal methods of contraception. Explain how hormonal and non-hormonal contraceptives work. Evaluate their use.</p>	
25 th January	<p><u>Lesson 17 – Use of hormones to treat infertility</u> Describe the use of fertility drugs in women with low FSH levels. Use a model, eg a flow diagram to explain the process of In Vitro Fertilisation (IVF). Evaluate the use of fertility treatments.</p>	
1 st February	<p><u>Lesson 18 – Negative feedback</u> Describe where and when adrenaline is released and its target organs. Describe the effects of adrenaline on the body. Draw a diagram to explain how levels of adrenaline are controlled by a negative feedback system. Describe where thyroxine is produced and its effects on the body. Draw a diagram to explain how its release is stimulated by thyroid stimulating hormone and the levels of these two hormones are controlled by a negative feedback system.</p> <p><u>Lesson 19 – Control and coordination in plants</u> Describe how plant shoots and roots respond to light and gravity. Draw diagrams to explain the role of auxin in plant responses in terms of unequal distribution in shoots and roots.</p>	
8 th February (Inset 12 th February)	<p><u>Lesson 20 – Required practical on plant growth</u> Required practical: plan and carry out an investigation into the effect of light on plant shoots. Observe, present and analyse the results in a later lesson. Interpret results of plant hormone experiments using secondary sources.</p>	

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	HT: Describe the functions of gibberellins and ethene in plants.	
February Half Term		
22 nd February	<p><u>Lesson 21 – Use of plant hormones</u></p> <p>Describe how auxins are used as weedkillers and rooting powders, and to promote growth in tissue culture.</p> <p>Describe the use of ethene to control the ripening of fruit during storage and transport.</p> <p>Describe the use of gibberellins to end seed dormancy, promote flowering and to increase fruit size.</p> <p>Review topic</p>	
1 st March	<p><u>TOPIC 6 INHERITANCE, VARIATION AND EVOLUTION</u></p> <p><u>Lesson 1 – Sexual and asexual reproduction</u></p> <p>Explain why sexual reproduction produces variation in the offspring, but asexual reproduction does not.</p> <p>Describe sexual reproduction in animals and plants.</p> <p>Define the term clone.</p>	
8 th March	<p><u>Lesson 2 – Meiosis</u></p> <p>Explain the term gametes and describe their genetic material.</p> <p>Explain why sexual reproduction results in variety.</p> <p>Draw diagrams to explain how gametes are formed in meiosis.</p> <p>Explain the number of chromosomes in the gametes during meiosis and fertilisation.</p> <p>Describe how an embryo is formed.</p> <p>Compare mitosis and meiosis</p> <p><u>Lesson 3 – Advantages/disadvantages of sexual and asexual reproduction</u></p> <p>Describe advantages and disadvantages of sexual and asexual reproduction.</p> <p>Describe some organisms that can reproduce by both methods:</p> <ul style="list-style-type: none"> •malarial parasites reproduce asexually in the human host, and sexually in the mosquito •many fungi reproduce asexually by spores, but asexually to produce variation •many plants reproduce sexually to produce seeds and asexually by runners, eg strawberry plants, or bulb division, eg daffodils. 	
15 th March	<p><u>Lesson 4 – Sex determination</u></p> <p>Explain using a Punnett square and genetic diagram how sex is determined in humans.</p> <p>Explain the probability of having a child that is a boy or a girl.</p>	
22 nd March	<p><u>Lesson 5 – DNA</u></p> <p>Describe the structure of chromosomes, DNA and genes.</p> <p>Explain that a gene is a small section of DNA that codes for a particular sequence of amino acids to make a specific protein.</p> <p>Describe what the genome is.</p> <p>Explain how knowledge of the human genome will help medicine in the future, eg identifying genes linked to cancers, understanding and treating inherited disorders. It will also help trace human migration patterns.</p> <p>Explain the ethical issues related to DNA sequencing.</p> <p><u>Lesson 6 – DNA structure</u></p> <p>Describe the structure of DNA using diagrams and models.</p> <p>Explain how the bases on the two strands link together.</p>	
29 th March	<p><u>Lesson 7 – Protein synthesis</u></p> <p>HT: explain how the bases on the two strands link together.</p> <p>Describe in simple terms how a protein is synthesised.</p> <p>Explain the importance of the shape of a protein for enzyme action and function.</p>	

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	<p>Describe what a mutation is and how a mutation could affect the formation of a protein. Explain that most mutations have little effect but a few have more serious effects on the function of the protein.</p> <p>Describe the function of non-coding parts of DNA and the possible effect of a mutation in a non-coding section of DNA.</p>	
Easter Holiday		
19 th April	<p><u>Lesson 8 and 9 – Genetic inheritance and inherited disorders</u></p> <p>Give examples of characteristics controlled by a single gene and describe their alleles.</p> <p>Give examples of characteristics controlled by multiple genes.</p> <p>Define and use the terms: gametes, genotype, phenotype, dominant recessive, homozygous and heterozygous.</p> <p>Complete a Punnett square to show the outcomes of genetic crosses.</p> <p>Interpret the results of a genetic cross diagram and use direct proportion and simple ratios to express the outcomes. Describe the genotypes and phenotypes of the offspring.</p> <p>Describe the inherited disorders polydactyly and cystic fibrosis.</p> <p>Use genetic cross diagrams to explain inheritance and carriers.</p> <p>Make informed judgements about the economic, social and ethical issues concerning embryo screening.</p> <p>Discuss the use of genetic modification to treat genetic disorders.</p>	
26 th April	<p><u>Lesson 10 – The understanding of genetics</u></p> <p>Describe some of the experiments carried out by Mendel using pea plants.</p> <p>Explain why Mendel proposed the idea of separately inherited factors and why the importance of this discovery was not recognised until after his death.</p> <p>Predict and explain the outcome of crosses using genetic diagrams based on Mendel's experiments and using unfamiliar information.</p> <p>Describe a timeline showing the main developments in the understanding of inheritance.</p>	
3 rd May	<p><u>Lesson 11 and 12 – Genetic engineering</u></p> <p>Define the term genetic engineering.</p> <p>Describe the process of genetic engineering and its advantages.</p> <p>HT: describe in detail the process of genetic engineering.</p> <p>Evaluate the use of genetic engineering in medicine, eg in gene therapy and production of hormones and some vaccines.</p> <p>Interpret information about genetic engineering techniques.</p> <p>Make informed judgements about the economic, social and ethical issues concerning genetic engineering and GM crops.</p> <p>Explain advantages and disadvantages of genetic engineering.</p>	
10 th May	<p><u>Lesson 13 – Cloning</u></p> <p>Define the term clone.</p> <p>Describe plant cloning techniques to include:</p> <ul style="list-style-type: none"> •taking plant cuttings •tissue culture. <p>Explain the importance of cloning to plant growers.</p> <p>Interpret information about plant cloning techniques.</p> <p>Explain advantages and disadvantages of plant cloning techniques.</p> <p>Explain why identical twins are clones.</p> <p>Describe animal cloning techniques to include:</p> <ul style="list-style-type: none"> •embryo transplants •adult cell cloning. <p>Present arguments for and against human cloning.</p> <p>Make informed judgements about the economic, social and ethical issues concerning cloning.</p>	
17 th May	AR2 preparation	

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24 th May	AR2 exam	AR 2 ASSESSMENTS
7 th June	DDI WAVE 1	AR 2 ASSESSMENTS
14 th June	DDI Wave 2 Reassessment and review	
21 st June	<u>Lesson 14 – Variation</u> Classify characteristics as being due to genetic, environmental or a combination of these causes. Give examples of continuous and discontinuous variation. Decide the best way to present information about variation in tables and charts.	
28 th June	<u>Lesson 15 – Selective breeding</u> Explain why humans selectively breed plants and animals. Describe selective breeding as a type of sexual reproduction. Describe the process of selective breeding and give examples. Explain the benefits and risks of selective breeding in plants and animals. <u>Lesson 16</u> Describe Darwin's theory of evolution by natural selection. Describe the main stages of natural selection as: •individual organisms within a particular species may show a wide range of phenotype variation because of differences in their gene individuals with characteristics most suited to the environment are more likely to survive to breed successfully •the genes that have enabled these individuals to survive are then passed on to the next generation. Define the term mutation. Explain why mutation may lead to more rapid change in a species. Define the term species. Identify organisms that are of different species. Interpret evolutionary trees.	
5 th July	<u>Lesson 17 – Speciation</u> Describe the work of Wallace. Explain how new species arise using the terms: •isolation •genetic variation •natural selection •speciation.	
12 th July	<u>Lesson 18 – Theory of evolution</u> State when Darwin published his theory and explain why it was only gradually accepted. Describe the work of Alfred Russel Wallace on natural selection. Describe the work of Jean-Baptiste Lamarck. Identify differences between Darwin's theory of evolution and conflicting theories. Suggest reasons for the different theories. Explain the terms inherited and acquired characteristics. <u>Lesson 19 – Evidence for evolution</u> Describe the evidence for the theory of evolution by natural selection. Define the term 'fossil'. Describe how fossils may be formed: •from parts of organisms that have not decayed because one or more of the conditions needed for decay are absent •when parts of the organism are replaced by other materials as they decay	

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	<p>•as preserved traces of organisms, eg footprints, burrows and rootlet traces. Explain why scientists cannot be certain how life began on Earth. Explain how fossils provide evidence for evolution. Explain what we should do to slow down the rate of development of resistant strains of bacteria. Describe the impact of antibiotic resistance.</p>	
<p>19th July (School closed from 22nd)</p>	<p><u>Lesson 20 – Extinction</u> Define the term extinction. Explain how extinction may be caused. Explain that organisms become extinct because something changes and the species cannot adapt quickly enough to the new circumstances.</p>	

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